

**Before the Independent Hearings Panel
At Wellington City Council**

Under Schedule 1 of the Resource Management Act 1991

In the matter of Hearing submissions and further submissions on the
Proposed Wellington City District Plan – Hearing Stream 5

**Statement of supplementary evidence of Malcolm Hunt on behalf of
Wellington City Council**

Date: 25 July 2023

INTRODUCTION:

1 My full name is Malcolm Hunt. I am an independent noise expert with my own consultancy based in Wellington. I have been engaged by Wellington City Council (the Council) as an independent expert to provide technical assistance on the proposed Wellington City District Plan (the Plan / PDP) noise matters.

2 I have read the respective evidence of:

Waka Kotahi and KiwiRail

- a) Noise evidence of Stephen Chiles – on behalf of Waka Kotahi and KiwiRail
- b) Michael Brown on behalf of KiwiRail Holdings Limited
- c) Catherine Heppelthwaite - on behalf of Waka Kotahi and KiwiRail

New Zealand Defence Force

- a) Noise evidence of Darran Humpheson

Wellington International Airport Limited (WIAL)

- a) Noise evidence of Darran Humpheson
- b) Planning evidence of Jo Lester
- c) Planning evidence of Kirsty O'Sullivan

Kāinga Ora – Homes and Communities

- a) Noise evidence of Jon Styles
- b) Planning evidence of Matthew Lindenberg
- c) Corporate Evidence Of Brendon Liggett

3 I have prepared this statement of evidence in response to expert evidence submitted by the people listed above to support the submissions and further submissions on the PDP.

4 Specifically, this statement of evidence relates to the matters of:
Hearing Stream 5 - Te Oro - Noise

5 I confirm I have the qualifications and experience as set out within my Evidence In Chief (EIC).

6 I confirm that I am continuing to abide by the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023, as applicable to this Independent Panel hearing.

SCOPE OF EVIDENCE

7 My statement of evidence addresses the expert evidence of those people listed above. Specifically, I have grouped my response to the expert evidence into the following topic areas:

- A. Acoustic Insulation Standards For Habitable Rooms
- B. Exemption For Altered Habitable Rooms
- C. State Highway Noise
- D. Ventilation – NOISE-S6
- E. Use Of The Term “Acoustic Engineer”

RESPONSES TO EXPERT EVIDENCE

A. ACOUSTIC INSULATION STANDARDS FOR HABITABLE ROOMS

- 8 Chapter 5 - Noise Te Oro sets out minimum standards for acoustic insulation for high noise areas (NOISE-S4) and moderate noise areas (NOISE-S5) using a 'standardised level difference' method for quantifying acoustic insulation which is based on the methodology of international standard ISO 717-1:2020 *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation*.
- 9 These proposed provisions are consistent with existing Operative District Plan acoustic insulation standards similarly specified for protecting sensitive indoor spaces within port noise affected areas and within the Centres, Central Area, Business Areas and Courtenay Place Area. These were established under Plan Change 23 in 2003 and further applied to commercial and business zones under Plan Change 73. Below I discuss the resistance experienced by Council previously to the adoption of the scientific approach of ISO 717-1:2020 and similar standards in place of the indoor Ldn limit which WIAL and BARNZ seek to retain.
- 10 Insulation standards NOISE-S4 and NOISE-S5 which utilise the 'standardised level difference' method for specifying acoustic insulation standards limits are opposed by noise experts Dr Stephen Chiles (on behalf of Waka Kotahi and KiwiRail) and Darran Humpheson (on behalf of WIAL) who would prefer the use of indoor noise limits (the "indoor Ldn" method) for prescribing insulation requirements. There are also comments on this made by the planning experts which rely on the opinions expressed by these two noise experts.
- 11 I note noise expert Jon Styles (on behalf of Kāinga Ora – Homes and Communities) strongly supports the use of the 'standardised level difference' approach to specifying insulation standards.

- 12 My evidence responds to concerns raised by Dr Chiles that the standardised level difference method is an “inefficient and partially ineffective approach” to controlling road and railway noise effects. I also respond to concerns raised by Mr Humpheson who also raises objections to the use of the standardised level difference method. At paragraph 5.29 of Mr Humpheson’s evidence he states the standardised level difference method may lead to ‘potential engineering overdesign’ and states at paragraph 5.33 that Council has not provided any evidence that the current sound insulation specification for insulation (Ldn 40 dB indoors) of the Operative Plan needs amending.
- 13 My advice to Council is that the improved acoustic indoor environment achieved within new or altered habitable rooms compliant with NOISE-S4 and NOISE-S5 (applied within their respective noise overlays) will more than justify the small incremental costs associated with achieving a higher standard of indoor noise protection when compared to the ‘bare minimum’ approach inherent within the indoor Ldn 40 dB method. I discuss this further below in relation to Figure 1.
- 14 I do not consider the ‘standardised level difference’ approach to be inefficient or partially ineffective. I consider NOISE-S4 and NOISE-S5 will deliver a better standard of acoustic protection than ‘indoor 40 dBA’ methods, however there are other advantages for Council and Plan users. I consider the ‘standardised level difference’ approach has the advantages of:
- a) Providing a compliance pathway established via compliance with tables of acceptable construction materials for the external building envelope of habitable rooms. Such standard minimum construction tables are attractive for designers, developers and home builders who may appreciate the ability to define a compliance pathway without

needing a specialist report¹. Tables setting out minimum construction standards for compliance with a set insulation standard are not possible to develop for use within district plan acoustic insulation requirements where the performance standard is based on the 'Indoor Ldn' method.

- b) In the event compliance with NOISE-S4 or NOISE-S5 needs to be checked, a suitable field test is available as a field test to verify compliance (ISO 140-5:1998 *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 5: Field measurements of airborne sound insulation of façade elements and façades*). As discussed within Comment C5.2.3.3 of NZS6806:2010, simplified field measurements can also be used as a simple field test for assessing conformance within 'standardised level difference' insulation standards.

15 The improved indoor sound levels under NOISE-S4 and NOISE-S5 are shown in **Figure 1** below which compares indoor aircraft noise levels (windows closed) due to the minimum acoustic standards set out within NOISE-S4 and S5 with the indoor aircraft noise levels expected under the existing acoustic insulation standard² (as if applied to properties within both the Inner and Outer Air Noise Overlays in the same way NOISE-S4 and S5 are proposed to be applied).

16 **Figure 1** shows that NOISE-S4 and S5 will deliver an indoor noise environment (due to outdoor aircraft noise) improved (lowered) between 4 dB and 10 dB compared to the indoor noise level under the

¹ Evidence of the attractiveness of such compliance pathways is found within (a) wording of WIAL's requested NOISE-S16 acoustic insulation standard which refers to adopting Table 1 of the Noise Chapter (Minimum construction requirements necessary to achieve a moderate external sound insulation level of $D_{nT,w} + C_{tr} > 30$ dB) which Mr Humpheson recommends as a means of compliance; and (b) the presence of the Table 1 construction table (from WCC Plange 23) found within Appendix 4B (Suggested plan policies and rules) to the Transit Planning Policy Manual dated August 2007 Manual No: SP/M/001.

² Rule 5.6.2.14 of the Operative Plan (40 dB Ldn indoors)

40 dB standard of Rule 5.6.2.14 of the operative plan. The results displayed for indoor noise levels resulting from the 'standardised level difference' method adopted within NOISE-S4 (30 dB reduction) and NOISE-S5 (35 dB reduction in outdoor noise) indicate a high standard of protection (lower indoor noise levels) will be achieved compared to the use of the 'indoor Ldn" method in Rule 5.6.2.14.

Figure 1 - Comparison of Existing & Proposed Aircraft Noise Insulation Standards

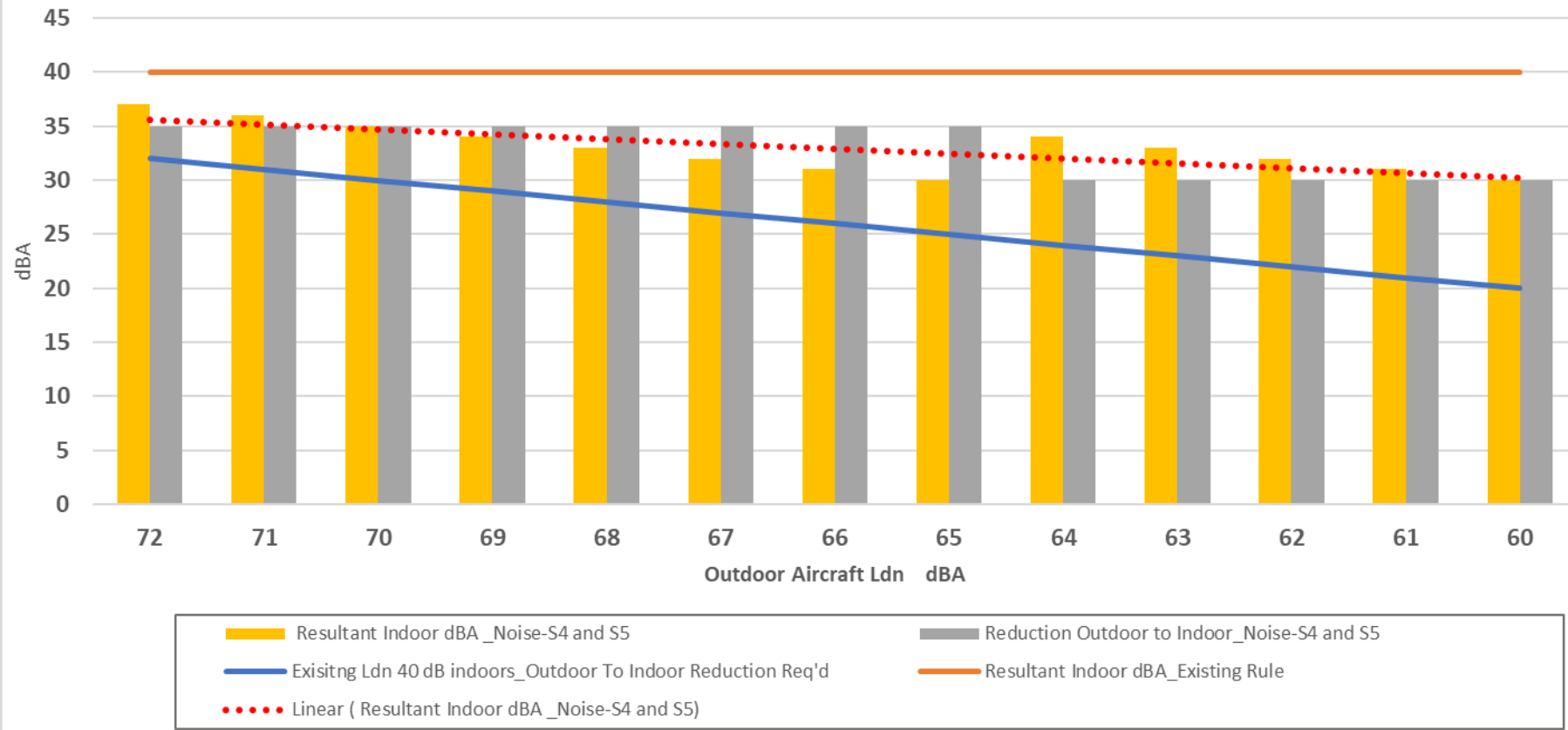


Figure 1 Graph comparing existing and proposed aircraft noise insulation standards – presents noise level reductions due to the building (outdoor to indoor) and resultant indoor noise levels, across the range of outdoor aircraft noise levels expected within the Inner Air Noise Overlay and Outer Air Noise Overlay areas.

- 17 Mr Humpheson also states (at para 5.25) the use of the 'standardised level difference' will likely lead to confusion and inconsistency, and requires Council to expend effort to assess compliance with NOISE-S4 and NOISE-S5 at the consenting stage for non-standard construction types not listed in Table I and Table II of the Proposed Plan's noise chapter.
- 18 I do not consider acoustic design certificates and the like, where compliance is assessed against 'standardised level difference' limits, will likely present any difficulty for Council to assess and check. The 'standardised level difference' has been adopted as an inner city acoustic insulation standard in the Operative District Plan since plan change 23 which became operative on 25 June 2004. Regarding aircraft noise, I noted at paragraph 60 of my EIC that due to the use of the 'indoor Ldn' method in Rule 5.6.2.14 of the operative plan, Council staff have already had to develop a work around to assist in defining outdoor aircraft noise levels which establish an important basis for compliance calculations³.
- 19 Furthermore, at paragraph 63 of my EIC, I confirm from my discussions with Council officers that adopting insulation rules for the various forms of transport noise using the 'standardised level difference' *"...will assist Council officers processing and checking acoustic design certificates and when checking compliance with NOISE-S4 and NOISE-S5"*.
- 20 I consider the approach of specifying a good standard of indoor thermal comfort by improving ventilation standards with a reduced the need to open windows (as is the case with proposed amended NOISE-S6) means room occupants can experience the full benefits of the improved standard of insulation against aircraft noise under NOISE-S4 and NOISE-S5.
- 21 I note that Mr Humpheson recommends a change to WIAL's requested NOISE-S16 acoustic insulation standard which they request to apply as a permitted activity insulation standard for new or altered habitable rooms within the Inner Air Noise Overlay (which I have rejected in my EIC, see paragraphs 52 to 64). The amendment recommended by Mr Humpheson refers to adopting as a compliance pathway Table 1 of the PDP Noise Chapter

³ See paragraphs 28 to 32 below where I set out an example of the uncertainty inherent in the "indoor Ldn" method due to the lack of a specified and certain outdoor aircraft sound spectrum.

(Table 1 - *Minimum construction requirements necessary to achieve a moderate external sound insulation level of $DnT,w + Ctr > 30$ dB*).

- 22 I do not agree this is a reasonable approach as the standard of insulation to be achieved within the high noise area will only reduce indoor levels of aircraft noise by 30 dB. This means indoor sound levels within the Inner Air Noise Overlay would range from 35 dB to 42 dB across the range of possible building sites within the Inner Air Noise Overlay. In my view, this standard of protection for noise sensitive indoor spaces is inadequate especially given the information Mr Humpheson presents on increasing annoyance and disturbance reported internationally regarding aircraft noise experienced on the ground (e.g. Mr Humpheson's paragraph 3.32 where he points out the finding in the literature that people were reporting higher level of annoyance at lower noise exposure levels than had previously been identified).
- 23 I disagree with Dr Chiles (on behalf of Waka Kotahi and KiwiRail) where he states at paragraph 6.2 that the proposed sound insulation standard for high noise areas (NOISE-S4) and moderate noise areas (NOISE-S5) are inefficient and only partially effective in controlling road and railway noise because many parts of buildings are required to provide more sound insulation to achieve appropriate internal levels, but the most exposed parts may not have sufficient sound insulation.
- 24 My response to these statements are;
- 1) In reaching his conclusion on this matter Dr Chiles fails to acknowledge the benefits of improved standards of acoustic insulation inherent within NOISE-S4 and NOISE-S5 which will deliver amenity and reduced annoyance benefits to occupants of insulated rooms. I consider standards NOISE-S4 and NOISE-S5 are not 'partially effective' but are fully effective in controlling road and railway noise within habitable rooms.
 - 2) I consider the acoustic insulation standards of NOISE-S4 and NOISE-S5 are efficient in achieving their purpose as they have been adopted for protecting sensitive indoor spaces within other zones and parts of the city. My enquiries reveal Council officers are happy with the efficiency of the standards as, for example, Council officers consider

these types of insulation standards have reduced noise complaints from inner city residents where the standard has been implemented.

- 3) As with calculating compliance with an indoor dBA limit, the 'standardised level difference' approach allows some building elements to be better acoustic insulators compared to other elements within the external building envelope to a habitable room. This is not unusual as the calculation allows for this. Indoor sound levels are the result of sound entering the building via various pathways and through different building elements. It is the total effect across all elements (based on the contribution from each element) that determines compliance.
- 4) Regarding 'overdesign', I believe Dr Chiles has not fully acknowledged the ability for an acoustic design certificate to be able to exempt rooms from compliance where outdoor noise levels are insufficient to cause concern, that is, where outdoor noise levels do not exceed:
 - Less than 55 dB LAeq (1h) for rail noise; or
 - Less than 57 dB LAeq (24h) for highway noise; or
 - Less than 57 dB Ldn for port noise.
- 5) These 'exemption' limits were specifically included in standards NOISE-S4 and NOISE-S5 to ensure acoustic insulation performance standards were not applied in situations where the outdoor noise levels are insufficient to warrant implementing measures to protect building occupants.
- 6) Despite Dr Chiles' concerns expressed on behalf of KiwiRail, I note that his other client (Waka Kotahi) has not submitted against NOISE-S4 or NOISE-S5 in terms of the general thrust of acoustic units adopted within these standards. The submission received from Waka Kotahi supports these standards although they have sought amended assessment criteria and inclusion of a vibration standard in NOISE-S4 and on NOISE-S5 in terms of distances from the state highway.

25 At para 6.5 Mr Humpheson considers I am critical of sound insulation standards based on an A-weighted fixed internal limit because this method allows a compliant building

envelope (external walls, roof and ceilings) to poorly control low frequency sound transmission from outside.

- 26 I confirm this is a concern of mine, however I also hold concerns around uncertainty within the calculations inherent in the 'indoor Ldn' method (as I discuss below) and the lack of a suitable field test method (or even a simplified field test method) to enable compliance with acoustic insulation standards based on 'indoor Ldn' limits to be field checked if necessary. Perhaps the most serious drawback is that the 'indoor Ldn' method does not enable construction tables of suitable (minimum) building materials to be drawn up and adopted within the PDP as a workable and attractive compliance pathway for many users.
- 27 At paragraph 58 of my Evidence in Chief (EIC), I stated that the outcome for the indoor environment (windows closed) is far from certain when acoustic insulation is specified using 'indoor Ldn limits as per the 40 dB indoor aircraft noise limit of Rule 5.6.2.14 of the operative plan.
- 28 Figure 3 of Mr Humpheson's evidence sets out a representative indoor aircraft noise level calculation using version 9 of a relatively well known software package called the INSUL calculation programme. The example calculation provided was intended to show how calculations adopted for assessing compliance with the 'indoor Ldn' limit do involve octave band sound calculations and do require consideration of the outdoor sound spectrum. I agree, the approach outlined in Figure 3 is the usual calculation method and is, in fact, similar in approach to calculations adopted for assessing compliance with the insulation standards specified within NOISE-S4 and NOISE-S5.
- 29 However, when I cross checked Mr Humpheson's Figure 3 calculations with calculations carried out using a slightly older version 8 of the INSUL program, I found differences in the way this program specified the outdoor aircraft noise spectrum, even though the software provided a spectrum which, when summed together, equated to an outdoor aircraft noise level of Ldn 65 dB.
- 30 Although the two INSUL calculations (Attached As **APPENDIX A**) adopted the same overall outdoor noise level (Ldn 65 dBA) it appears version 9 of INSUL has provided a different

sound spectrum to that provided by version 8 of this program. The two octave band sound spectrum are compared in **Figure 2** below.

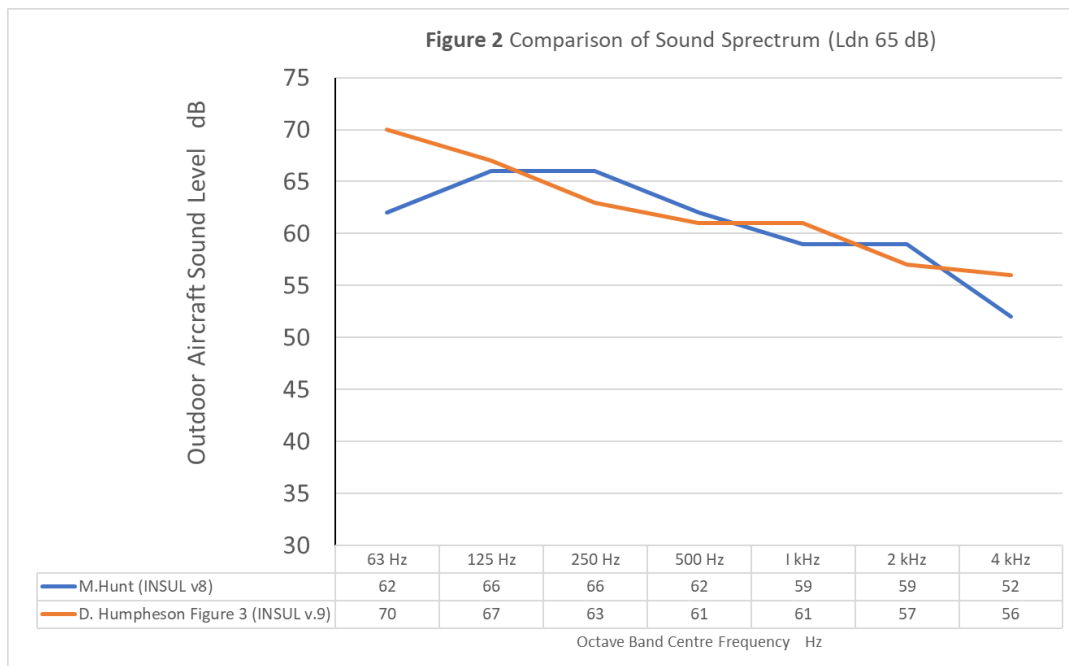


Figure 2 Differences in aircraft noise spectrum meeting Ldn 65 dB outdoors, as derived from version 8 and version 9 of the widely adopted INSUL acoustic prediction software.

- 31 As can be seen from APPENDIX A, the effect of the above differences in outdoor aircraft sound spectra causes a 3 dB difference in the performance of building element 1 and a 1 dB difference in building element 2. The overall room calculation differs by 1 dB due to the different spectra assumed in the calculation.
- 32 While I agree these differences are small, this is for a calculation based on the same outdoor aircraft noise level and evaluating the same building elements using two different versions of the same software. Far larger differences could be expected within acoustic insulation reports submitted to Council using other methods and other assumed outdoor aircraft noise spectra. The nub of this issue being there is no uniform or specified outdoor aircraft sound spectra available to ensure that calculations of compliance with ‘indoor Ldn’ type insulation standards are undertaken on a consistent basis. A key aspect of the ‘standardised level difference’ method in the PDP is that the sound spectra used to evaluate sound transmission loss of building elements utilises a special prescribed sound spectrum, being ‘Ctr’. The ‘Ctr’ spectrum adaption term is applied to the sound insulation

performance curve of an element or structure. This spectrum targets low frequency noise in particular sound performance in 100–315 Hz region.

- 33 The planning evidence of Kirsty O'Sullivan on behalf of WIAL (at paragraph 5.65) makes observations of Mr Humpheson's evidence and surmises that NOISE-S4 will result in overdesign of buildings within the Air Noise Overlay and thus unnecessary cost. However, I do not believe insulation costs of new or altered habitable rooms, to which NOISE-S4 and NOISE-S5 apply, are likely to be unreasonable given the indoor noise protection achieved. I consider negative comments from Ms O'Sullivan around 'over design' to signal a rejection of the costs of providing a good quality insulation standard that provides a relatively high standard of acoustic isolation and better protection of sensitive indoor spaces than provided for in standards based around achieving Ldn 40 dB indoors.
- 34 The Quieter Homes Programme is a planned approach by WIAL to treat existing homes and other noise sensitive buildings by progressively providing, across noise-affected areas, acoustic mitigation and mechanical ventilation in a planned and controlled manner in line with the Quieter Homes Programme.
- 35 At paragraph 5.32 of his evidence Mr Humpheson confirms the design requirement for the Quieter Homes Programme is 45 dB Ldn within habitable rooms. Mr Humpheson is critical of NOISE-S4 because he is concerned that if a home is treated under the scheme and then this home owner seeks to extend their property, the performance requirements of NOISE-S4 would apply, result in differing noise measurement requirements and resultant noise environments within the property. I do not consider this to be a live issue as the same 'inconsistency effect' would occur if the building extension were designed to comply with the Ldn 40 dB indoor noise limit proposed to be retained by WIAL.
- 36 Ms Jo Lester, planning manager on behalf of WIAL, states (at paragraph 5.38) that WIAL is also concerned that the approach of acoustic insulation standards NOISE-S4 and NOISE-S5 is inconsistent with the Airport's well established and effective Quieter Homes Programme.
- 37 I do not agree with Ms Lester as I do not consider there is any linkage between the Quieter Homes Programme and PDP acoustic insulation standards NOISE-S4 and NOISE-S5

(and ventilation requirements of NOISE-S6). I do not agree that any aspect of the Quieter Homes Programme should influence any decisions being made around Noise - Te Oro Chapter of the PDP.

38 This is because the Quieter Homes Programme was developed by WIAL in consultation with affected resident groups and is not mandated by the PDP Noise - Te Oro Chapter of the PDP. The requirement on WIAL rests with the Airport designation provisions (condition 28 of the WIAL 4 designation). Whilst the retro-fit acoustic insulation/ventilation scheme could be interpreted as consistent with some of the objectives and policies of the Noise - Te Oro Chapter of the PDP, the programme sits to one side as it is not a requirement of the PDP Noise Chapter. I therefore do not believe impacts of decisions around acoustic insulation standards NOISE-S4 and NOISE-S5 and ventilation requirements of NOISE-S6 would impact any aspect of the Quieter Homes Programme.

39 Regarding the suggested re-wording of the introduction to the Airport Zone chapter, I note Ms O'Sullivan has recommended some text I consider helpful in relation to explaining the function of Inner Air Noise Overlay and the Outer Air Noise Overlay at Item (5). However, I am concerned the terminology used is inconsistent with NZS6805:1992 in relation to the use of the term "boundary". NZS6805 only refers to 'boundaries' as a line adopted to control aircraft noise. This is not the function of the outer edge of the Outer Air Noise Overlay. I therefore recommend the following amendment to item 5 of the introduction to the Airport Zone chapter;

5. The Inner Air Noise Overlay and the Outer Air Noise Overlay, which are used to manage intensity of development by noise sensitive activities (such as residential development). The Outer edge of the Inner Air Noise Overlay approximates the ANB. The outer edge of the Outer Air Noise Overlay approximates a 60 dB Ldn noise contour ~~boundary~~.

B. EXEMPTION FOR ALTERED HABITABLE ROOMS

40 Planning expert Matthew Lindenberg on behalf Kāinga Ora – Homes and Communities (at paragraph 9.2(b)) requests that NOISE-S4 and NOISE-S5 include an exemption from the acoustic insulation standards where only minor alterations or additions are made to

habitable rooms. Mr Lindenberg opines that failing to provide a permitted pathway for minor alterations that do not have to comply with acoustic insulation standards NOISE-S4 and NOISE-S5, runs the risk that normal urban renewal and renovation of existing dwellings would be stalled. He considers that such work will be discouraged due to costs imposed on homeowners to undertake these minor works in compliance with NOISE-S4 and S5.

- 41 I agree that some exclusion for minor additions or alterations should be provided to address this possibility. Acoustically, I can confirm that indoor noise conditions for occupants within habitable rooms which have undergone minor extensions or alterations (where the new parts of the structure comply with NOISE-S4 or S5) would be no different that if the minor alteration or extension were of standard (typical) construction and were not designed to be compliant with NOISE-S4 or S5. This is because the improved acoustic performance of the added parts of the structure will not improve the overall sound insulation rating of the building envelope of the room and thus, the existing acoustic weakness in the structure will mean indoor noise levels will remain unaffected by the minor alteration or extension.
- 42 In settling on appropriate wording of an exemption to address this issue, I have not adopted the wording proposed by Mr Lindenberg. This is because his proposed wording would allow a dwelling to develop an extra bedroom or sleeping room which, by definition, would not be acoustically insulated in accordance with NOISE-S4 or S5. I do not agree that the exemption for minor additions or extensions should allow for any increase in the number of bedrooms.
- 43 In addition, I consider the maximum gross floor area of 25 m² added to a habitable room, as proposed by Mr Lindenberg, to be too generous. Based on my experience with other district plans, I recommend a limit of no more than a 10% increase to the gross floor area of the habitable room. I consider it reasonable that alterations or extensions of more than 10% of the gross floor area of habitable rooms would trigger NOISE-S4(1) or NOISE-S5(1) so that the whole room is assessed. This is because it is only by the appropriate treatment of all external building elements of a room can indoor noise levels be controlled to acceptable levels in high or moderate noise areas.

44 To give effect to my recommendation for this exception to minimum insulation requirements of the PDP for minor upgrades or extensions to habitable rooms, I recommend the following words be added as a new provision NOISE-S4(2) and NOISE-S5(2) as follows:

2. *Any alteration or addition to a habitable room used by a noise sensitive activity within an existing building, which does not increase the gross floor area of the affected room by more than 10%, providing that the addition or alteration does not increase the number of bedrooms or sleeping rooms.*

45 I recommend the words '*Except as provided for in (2)*' be inserted in at the commencement of NOISE-S4(1) and NOISE-S5(1) in order to give effect to the new provisions NOISE-S4(2) and NOISE-S5(2).

46 I consider, as worded above, that this new permitted activity standard will operate appropriately to ensure minor additions or alterations to existing habitable rooms are suitably exempted while ensuring larger scale alterations and additions would need to comply with NOISE-S4(1) and NOISE-S5(1) in the usual way.

C. STATE HIGHWAY NOISE

47 At para 7.3 Dr Chiles, on behalf of Waka Kotahi, explains he has selected a 'reasonable' specification for acoustic insulation against outdoor road noise using a sound level measured indoors, in units LAeq(24 hour). Dr Chiles states his recommended indoor dBA noise standard is based on NZS6806:2010 *Acoustics – Road-traffic noise – New and altered roads*. However, as with methods recommended for specifying acoustic insulation of rooms against aircraft noise, I do not support the use of 'indoor dBA' methods for specifying acoustic insulation against outdoor traffic noise.

48 My reading of NZS6806:2010 reveals this Standard does not recommend the use of indoor dBA sound levels when specifying acoustic insulation against traffic noise. Clause 5.2.3.2 of NZS6806:2010 states "*this Standard requires the acoustic performance of buildings to be specified, and where necessary, rated using the 'standardised level difference' which describes the acoustic performance of the external building envelope (including windows, walls, ceilings, and floors where appropriate).*"

49 Regardless of the method used to specify acoustic insulation, Dr Chiles and I are in agreement about the advantages of using a contour approach to indicating areas affected by current and future noise from the state highway network. Jon Styles, noise expert for Kāinga Ora, also strongly supports the use of traffic noise contours for defining the spatial extent of road noise controls. I note Brendon Liggett, providing corporate evidence on behalf of Kāinga Ora, supports that transport noise corridors should be spatially modelled in the PDP. At paragraph 4.11 of his evidence, he considers that spatial mapping can more appropriately identify noise effects rather than the blanket application of setback distances through the Plan provisions, which I agree with.

50 However, I recommend any new information such as electronic files suitable for mapping overlays of state highway noise should be provided with suitable supporting documentation to enable the technical veracity of the mapped areas to be checked. To this end, I support an independent peer review of this new information be carried out prior to being considered for inclusion in the PDP.

51 I note Dr Chiles (at paragraph 8.2) supports my proposal that 'moderate' noise areas extend out to 100 metres from State Highways, but only where the posted speed limit is above 70 km/h. Dr Chiles identifies possible ambiguity with the use of the term 'posted speed limit' as 'variable speed signs' are also employed within the boundaries of Wellington City to control vehicle speeds. My enquiries confirm variable speed limit signage (authorised under Land Transport Rule: Setting of Speed Limits 2017) are enabled at several locations along the State Highway network in the district which may temporarily set vehicle speed limits to 70 km/hr or less (due to road safety or other reasons) while a limit of >70 km/hr is set at other times. If the maximum variable speed limit can be set >70 km/hr, then I agree these sections of highway should be treated the same as those portions of the State Highway network where the posted speed limit is >70 km/hr.

52 Catherine Heppelthwaite (planning expert on behalf of Waka Kotahi) proposes this issue be resolved by adopting the following wording to define the 'moderate' noise areas adjacent to the State Highway network;

"The area between 40m and 100m of a State Highway with a posted speed limit or maximum variable speed limit greater than >70 km/hour".

53 I support this proposal of Catherine Heppelthwaite as an effective means of dealing with variable speed signage when defining moderate noise areas.

D. VENTILATION - NOISE-S6

54 In paragraphs 101 to 117 of my EIC, I outlined the improvements I recommended (with input from an experienced ventilation engineer) to the permitted activity minimum ventilation standards of NOISE-S6. Mr Humpheson (on behalf of WIAL) has drafted an alternative ventilation standard (named NOISE-S17) which would only apply to new or altered habitable rooms located within the Inner Air Noise Overlay or Outer Air Noise Overlay.

55 My response is that, firstly, I do not support the concept of an airport-noise specific ventilation standard. In my opinion, it would undermine the integrity of the unified approach of the PDP which is structured to ensure that occupants of acoustically insulated rooms, exposed to all types of outdoor noise, are provided with appropriate ventilation. Secondly, Mr Humpheson does not support the need for the installed ventilation system to provide for periods of high air flow (up to six air changes per hour) so that the room may be 'flushed' – such as when odours may occur or upon finding the room excessively heated (naturally by the sun) when first entering the room.

56 This requirement for a 'room flush' provision within rooms required to be mechanically ventilated was supported by the advising engineer Mr Owen Brown and was requested within the submission by KiwiRail (submission point 408.113) and Waka Kotahi (submission point 370.232).

57 I consider it a short-coming of Mr Humpheson's proposed ventilation standard (NOISE-S17) that it does not include a high rate room flush requirement in rooms required to be fully mechanically ventilated. I also do not support the allowance for noise emitted during the operation of the ventilation system to operate up to 40 dB within non-sleeping rooms, as this could be an intrusive sound level when undertaking quiet tasks such as listening to TV or other devices. If the ventilation system is found to be too noisy, occupiers may not use it and prefer to use opening windows for ventilation, which should be discouraged in my view as it negates the benefit of closed windows in reducing exterior noise.

58 I understand Mr Humpheson’s NOISE-S17 minimum ventilation standard is aimed at minimising system specifications, due to a concern that it may impact on WIAL, if the standard impacted on operation of the Quieter Homes Programme. However, I do not consider there to be any material linkage between this programme and ventilation standard NOISE-S6 such that WIAL would be obligated to install a NOISE-S6-complaint system into candidate buildings for the Quieter Homes Programme.

E. USE OF THE TERM “ACOUSTIC ENGINEER”

59 Section 5 of the evidence of noise expert Jon Styles (on behalf of Kāinga Ora – Homes and Communities) rejects the use of the term “acoustic engineer” within NOISE-S4 and NOISE-S5 to specify who may prepare acoustic assessments and design certificates. He considers this term unreasonably narrows the number of suitably qualified people that could carry out the work.

60 I agree with Mr Styles that this issue can be resolved by adoption a similar term “Suitably qualified and experienced acoustic expert” within NOISE-S4 and NOISE-S5. I agree this specification is more appropriate and agree this term is widely used in New Zealand. I have recommended this amendment be made to NOISE-S4 and NOISE-S5.

Date: 25 July 2023



Name: Malcolm Hunt

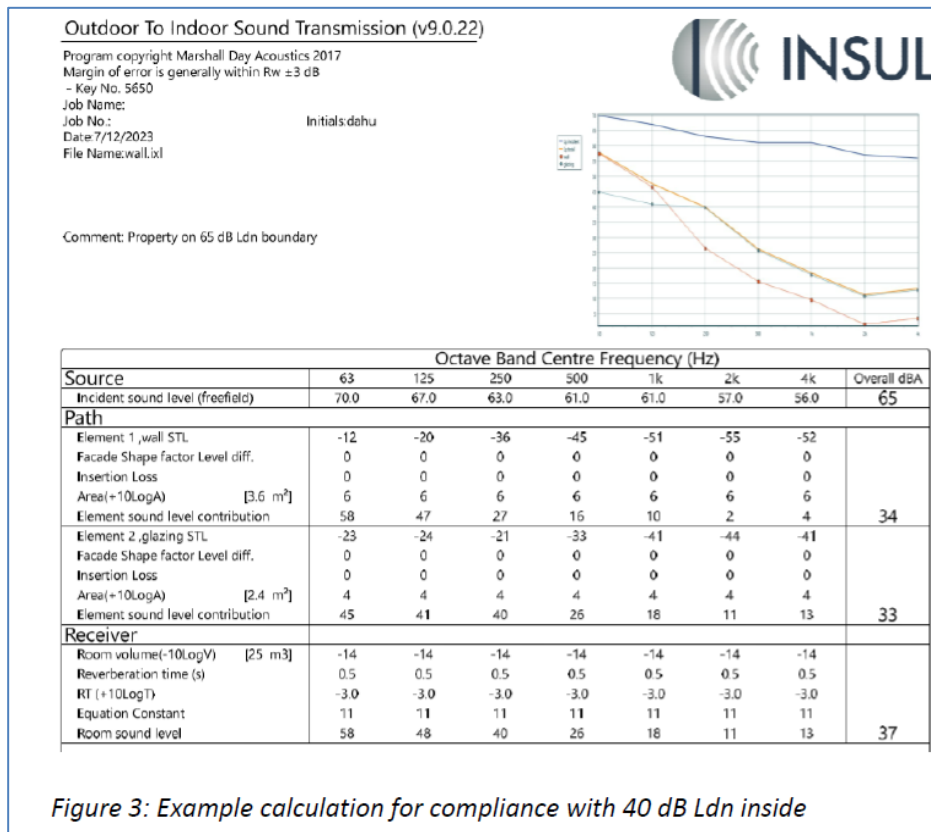
Position: Noise Expert

On behalf of Wellington City Council

APPENDIX A

Two INSUL calculations of indoor aircraft noise levels based on the same overall outdoor noise level (Ldn 65 dBA).

A. Figure 3 of Mr Humpheson's Evidence (version 9 of INSUL)



B. Mr Hunt's INSUL calculation based on sound spectrum to that provided by version 8 of the INSUL program

